

Agenda for 2-Day Lagoon Troubleshooting Workshop



Day One	
8:00 am to 8:30 am	Registration
8:30 am to 10:00 am	Mastewater Lagoon Microbiology, the basics of how lagoons work to stabilize waste. Lagoon Food Webs, nutrient cycling, and how water quality changes with changing depth. Variables affecting pond performance. The role of various microbes in a lagoon system. Diagnosing Wastewater Lagoon Problems. How to determine the source of lagoon problems. The eleven things an operator must know to troubleshoot or optimize a lagoon. The essential role of monitoring and record keeping in solving problems in a lagoon system. How pond chemistry changes over the day & year. Sampling locations and a discussion of the value of different tests. How to interpret test results.
10:00 am to 10:15 am	Break
10:30 am to 12:00 pm	Section 2 <u>Diagnosing and Troubleshooting BOD₅ Problems</u> . Where and how to sample. The six steps to take to isolate the cause of a BOD ₅ problem. Typical loading rates. How to tell if your lagoon can handle additional load from a new subdivision, jail, hotel, handle septage, or industrial waste. Understanding CBOD ₅ vs. BOD ₅ . Diagnostic BOD ₅ Case studies from the field on solving BOD ₅ issues.
12:00 pm to 1:00 pm	Lunch
1:00 pm to 2:00 pm	Section 3 Troubleshooting TSS Problems. What is TSS? Algae related TSS problems. The benefits of algae. Algae's problematic side and in-pond strategies to remove algae. Methods for controlling algae growth. Lagoon colors and their meaning. Ingenious non-chemical methods for the removal of Duck weed. Case studies on algae suppression and growth from various cities.
2:00 pm to 2:15 pm	Break
2:15 pm to 3:30 pm	Section 4: Sludge Accumulation and Removal. The problems accumulated sludge creates. Ten signs indicating it is time to remove sludge. Fifteen things that affect the rate of sludge accumulation. Typical sludge removal rates. How to determine the volume of sludge, sludge judging and core sampling. Things to consider before sludge judging a lagoon and how to prepare for this test. Formula for determining sludge volume and mass. How to Desludge a pond. Getting free sludge removal. The costs of sludge removal and how to protect yourself. Troubleshooting Ammonia and Phosphorous Problems. Nitrogen removal pathways and the eleven key factors that determine the rate of nitrogen removal. The chemistry and biology of nitrogen removal in lagoon systems. How to optimize a lagoon system for nitrogen removal. Case studies from cities that have controlled their ammonia & phos problems.

3:30 pm to 5:00 pm	Section 5: Pond Hydraulics How to calculate theoretical retention time and six things that cause short-circuiting in a lagoon system. How to tell if a pond has a short circuiting problem. Thermoclilne's role in short-circuiting and how to deal with water density problems. Confirming short-circuiting problems and how to solve them. Case study from city solving a gross short circuiting problem.	
Day Two		
8:00 am to 8:30 am	Registration	
8:30 am to 10:00 am	Section 6: Troubleshooting Aeration and Dissolved Oxygen Problems Factors competing for oxygen in a lagoon. How dissolved oxygen concentrations change in a lagoon and why that is important to you. Seventeen possible causes of low dissolved oxygen concentrations. Oxygen demand calculations. How to properly conduct a dissolved oxygen profile. Solutions to low dissolved oxygen concentrations. Troubleshooting low D.O. Case Study on how to solve odor and low dissolved oxygen problems.	
10:00 am to 10:15 am	Break	
10:15 am to 12:00 pm	Section 7: Pathogen Control. Factors effecting bacteria, virus, and parasite die-off rates in lagoons. How to maximize a lagoon's natural disinfection process. Chlorine residual. Maintenance. What EPA inspectors look for when examining your pond system. Dike maintenance, erosion control, vegetation control, leaky ponds and the importance of record keeping. When lagoons go bad and what to do about it.	
12:00 pm to 1:00 pm	Lunch	
1:00 pm to 3:00 pm	Section 8: Industrial Lagoon Troubleshooting The difference between industrial and municipal lagoon systems. Optimizing anaerobic ponds used to treat industrial wastewater. Nutrient deficiencies—feeding an industrial lagoon system for optimum performance.	
3:00 pm to 3:15 pm	Break	
3:15 pm to 5:00 pm	Section 9: Cold Weather Operations How water temperature affects the chemistry and biology of a lagoon system. How temperature affects pond mixing. Cold weather operations. Predicting water quality based on changes in temperature. Wrap up. Case study on actual lagoons meeting very high effluent quality standards, and the costs of one city's painful lagoon decommissioning. Evaluations and Certificates	